

## REMARKS

This is in response to the Office Action dated June 18, 2008 (the Action).

Applicant appreciates the Examiner's inquiry regarding the dependency of Claims 13 and 14 on page 2 of the Action. In response, Applicant has amended Claims 13 and 14 above to depend from Claim 1.

Claims 1, 2, 4-8, 10, 12, 16-19, 21-25, 27-30, 32, 36 and 37 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,390,403 to Batchelder ("Batchelder"). Claims 9, 15, 26 and 33-35 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,294,063 to Becker ("Becker"). Claims 11 and 31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder in view of U.S. Patent No. 6,149,789 to Benecke ("Benecke").

Applicant has amended independent Claims 1 and 18 to clarify that the exposed liquid surface defines a liquid/air interface for suspending a particle. Claims 38 and 39 are new and recite that the particle is suspended in the liquid composition at the liquid/air interface such that a portion of the particle contacts the liquid composition and another portion of the particle contacts air at the liquid/air interface. Support for the above amendments can be found, for example, in Figures 1A-1C and in Applicant's specification on page 4, line 20 and page 9, lines 1-3.

Reconsideration is requested in view of the amendments above and the remarks that follow.

### **I. Independent Claims 1 and 18**

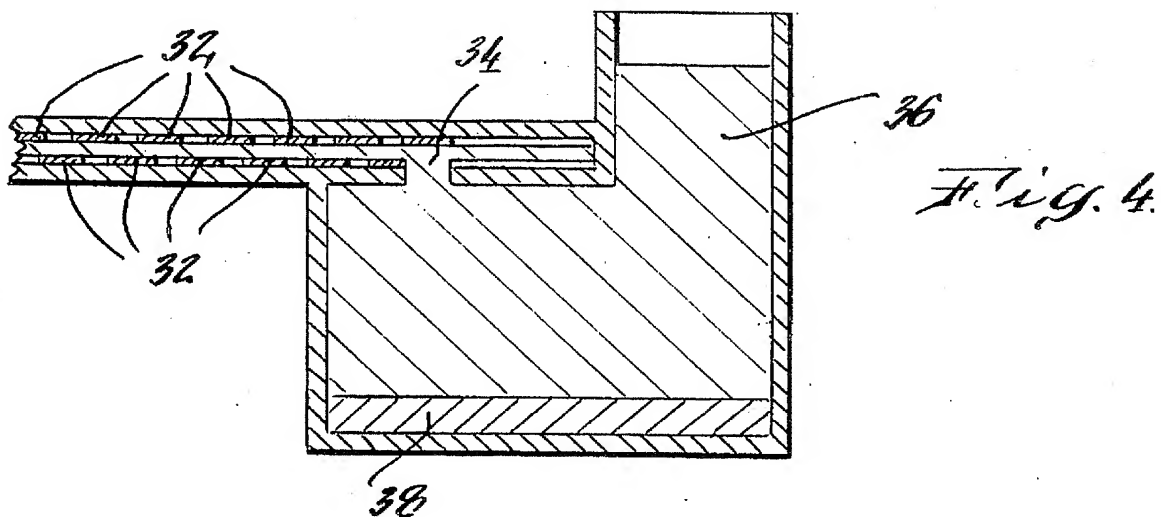
The Action states that Batchelder discloses a liquid composition having an exposed surface for suspending the particle as follows:

With respect to this liquid composition having an exposed surface for suspending the particle, because this lubricant is disclosed as only being present between the device surface and the particles being manipulated (col. 5, ll.9-17), the liquid composition would have an exposed liquid surface and the particle would be suspended at that surface.

See the Action, page 4.

As best understood by Applicant, the Action is taking the position that the lubricant in Batchelder, which is placed between the material being manipulated and the containing surfaces, is analogous to the "exposed liquid surface" recited in Claims 1 and 18. However, as discussed in Applicant's specification on page 4, line 20, the exposed surface is "in open contact with surrounding air."

Applicant submits that the lubricated surface of the device in Batchelder does not provide an exposed surface. However, in order to expedite prosecution, Claims 1 and 18 have been amended to clarify that exposed liquid surface defines a liquid/air interface for suspending a particle. Applicant submits that this recitation is clearly not disclosed or rendered obvious by Batchelder, which discusses a method and apparatus for manipulating one or more chemical species within a housing using dielectrophoretic forces resulting from applied non-uniform fields. *See* col. 2, lines 12-29. For example, Batchelder discusses a ladder electrode array 32, which moves material to be ejected between the electrodes of the array 32 to a port 34 in Figure 4 (reproduced below). *See* col. 7, lines 13-20. Applicant submits that the fluid in the array 32 of Batchelder clearly does not define a liquid/air interface.



In contrast, as shown, for example, in Figure 1A of the current application, the microdroplet 12 is suspended in a liquid 16 (for example, fluorinated oil) that has an exposed

surface 16A that defines a fluid/air interface. According to embodiments of the current invention and as illustrated in Figure 1A, the droplet 12 is not in contact with any of the solid surfaces of the device 10, such as the solid surfaces of the electrodes 14A-F or the substrate 17. In this configuration, surface fouling, evaporation, adsorption of the droplet 12 (or components carried by the droplet 12), and chip contamination may be reduced. Figure 1A of the current application is reproduced below.

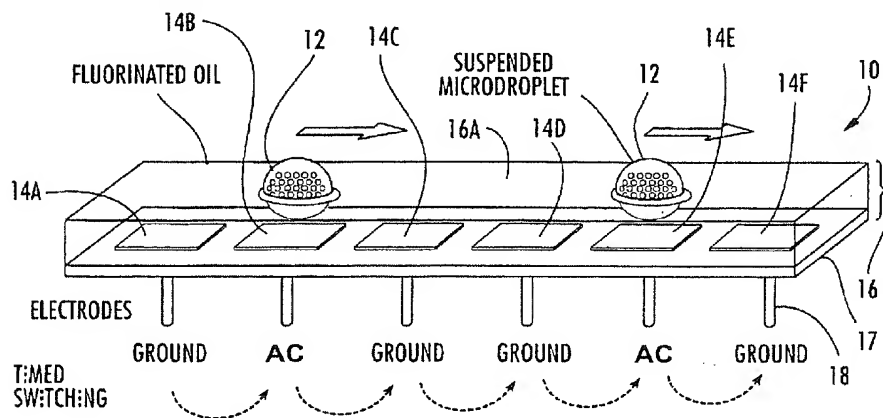


FIG. 1A

For at least the reasons discussed above, Applicant submits that Batchelder does not disclose or render obvious at least the recitations of Claims 1 and 18 emphasized below:

Claims 1 and 18 are reproduced below.

1. A device for the manipulation of a suspended particle in an electric field gradient comprising:
  - a plurality of electrically isolated electrodes on a surface; and
  - a liquid composition on said plurality of electrodes, said liquid composition covering said surface continuously between adjacent ones of said plurality of electrodes, said liquid composition having an exposed liquid surface defining a liquid/air interface for suspending a particle;
  - said plurality of electrodes configured to provide an electric field gradient for transporting the particle suspended in said liquid composition at said liquid/air interface; and
  - a particle suspended in said liquid composition at said liquid/air interface, wherein said particle is spaced apart from said plurality of electrodes.

18. A method for the manipulation of a suspended particle in an electric field gradient comprising:  
configuring a plurality of electrodes on a surface to provide an electric field gradient for transporting a particle;  
applying a liquid composition on the plurality of electrodes, the liquid composition having an exposed liquid surface defining a liquid/air interface for suspending a particle;  
suspending the particle in said liquid composition at the liquid/air interface;  
applying a voltage between selected ones of the plurality of electrodes to provide the electric field gradient, the electric field gradient having a pattern that defines a pathway for transporting the particle at said liquid/air interface; and  
transporting the particle along the pathway defined by the electric field gradient at said liquid/air interface, wherein the particle is spaced apart from the plurality of electrodes.

The above-emphasized recitations are also not disclosed in Becker (which is cited as allegedly disclosing the recitations of Claims 9, 15, 26 and 33-35) or Benecke (which is cited as allegedly disclosing the features of Claims 11, 13, 14 and 31).

Accordingly, Applicant submits that independent Claims 1 and 18 are patentable for at least the reasons discussed above. Claims 2 and 4-17 depend from Claim 1 and Claims 19 and 21-37 depend from Claim 18. Such claims are likewise patentable based on the claims from which they depend. Applicant respectfully requests that the rejections of Claims 1-2, 4-19 and 21-37 be withdrawn.

## **II. New Claims 38-39**

New Claims 38 and 39 depend from independent Claims 1 and 18, respectively, and are patentable based on the claims from which they depend. In addition, Claims 38 and 39 are separately patentable for at least the following reasons.

Claims 38 and 39 recite that the particle is suspended in the liquid composition at the liquid/air interface such that a portion of the particle contacts the liquid composition and another portion of the particle contacts air at the liquid/air interface. As discussed above, the electrode array 32 of Batchelder does not disclose a liquid/air interface. Moreover, the materials that are manipulated by the array 32 in Batchelder would clearly not be suspended

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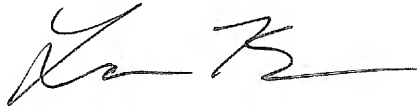
such that a portion thereof would contact the liquid composition and another portion thereof would contact air at the liquid/air interface.

For at least the above reasons, Applicant submits that Claims 38 and 39 are separately patentable and request an indication of same.

### CONCLUSION

Accordingly, Applicant submits that the present application is in condition for allowance and the same is earnestly solicited. Should the Examiner have any matters outstanding of resolution, he is encouraged to telephone the undersigned at 919-854-1400 for expeditious handling.

Respectfully submitted,

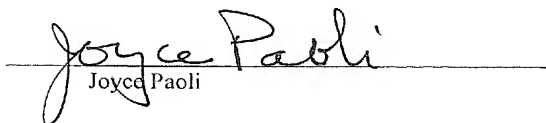


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### CERTIFICATION OF TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4) to the U.S. Patent and Trademark Office on November 18, 2008.

Signature:   
Joyce Paoli